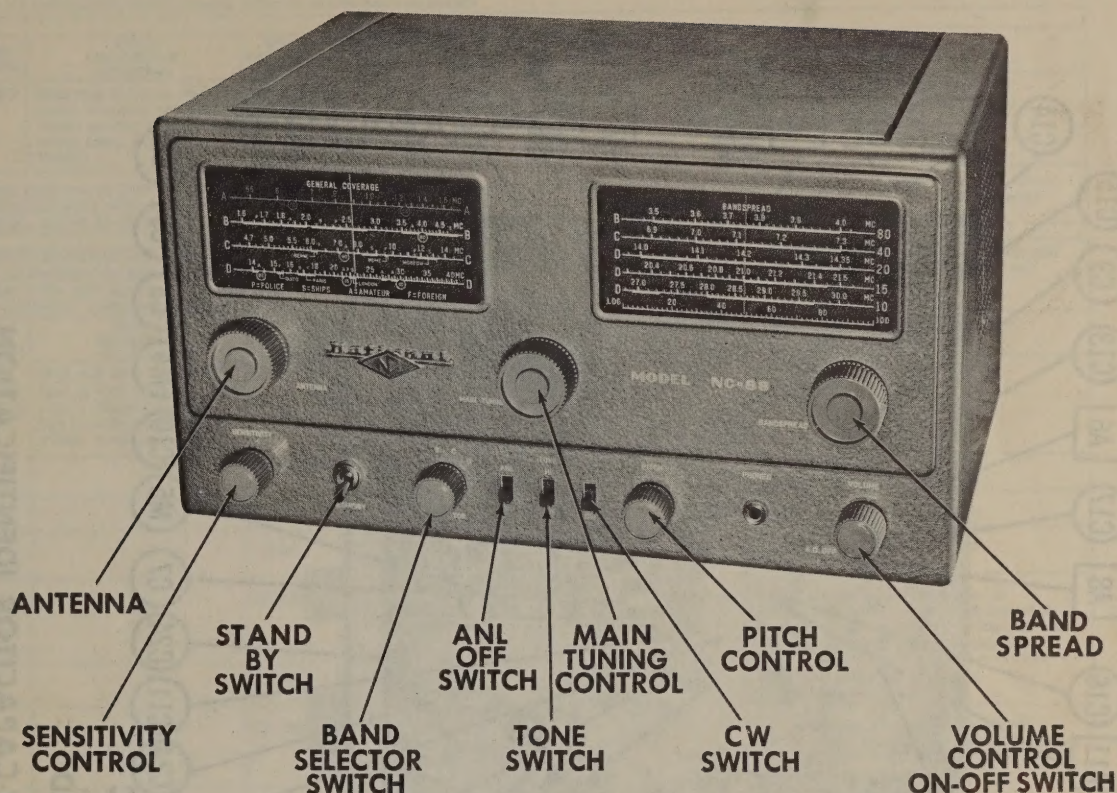




NATIONAL  
MODEL NC-88



NATIONAL  
MODEL NC-88

TRADE NAME	National Model NC-88	
MANUFACTURER	National Co., Inc., 61 Sherman St., Malden 48, Mass.	
TYPE SET	AC Operated 4-Band Superheterodyne Communications Receiver	
TUBES (Nine)	Types 6BA6 RF Amp., 6C4 Osc., 6BE6 Mixer, (2) 6BD6 IF Amp., 6AL5 Det.-AVC - Noise Limiter, 12AX7 CW Osc.-AF Amp., 6AQ5 Audio Output, 5Y3GT Rectifier	
POWER SUPPLY	105/130 Volts AC-50/60 Cycles	RATING .56 Amp. @ 117 Volts Ac
TUNING RANGE	Band "A" — 540-1600KC Band "B" — 1.6-4.7MC	Band "C" — 4.7-14.0MC Band "D" — 14.0-40MC

**HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana**

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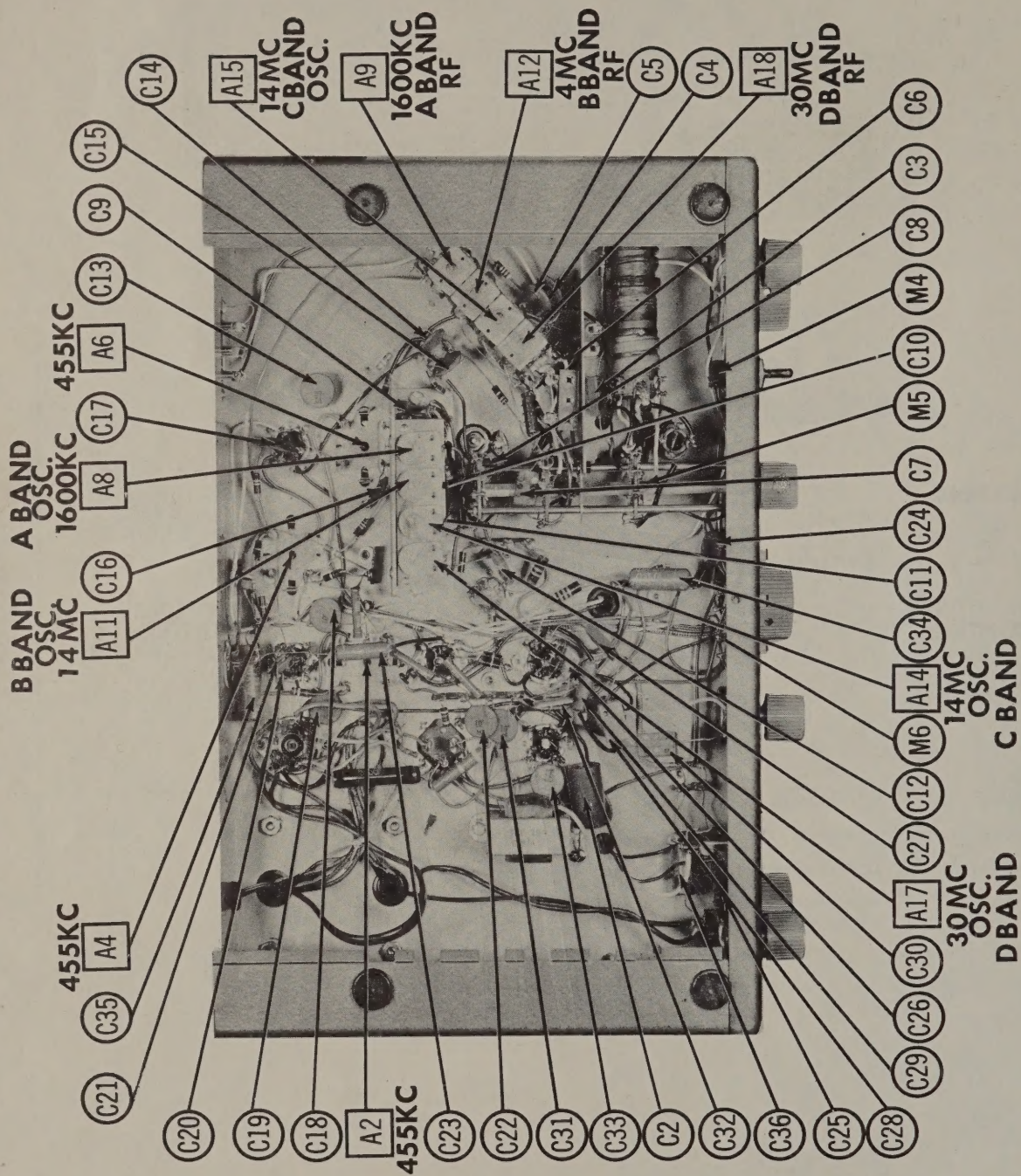
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DATE 3-54

SET 233

FOLDER 7





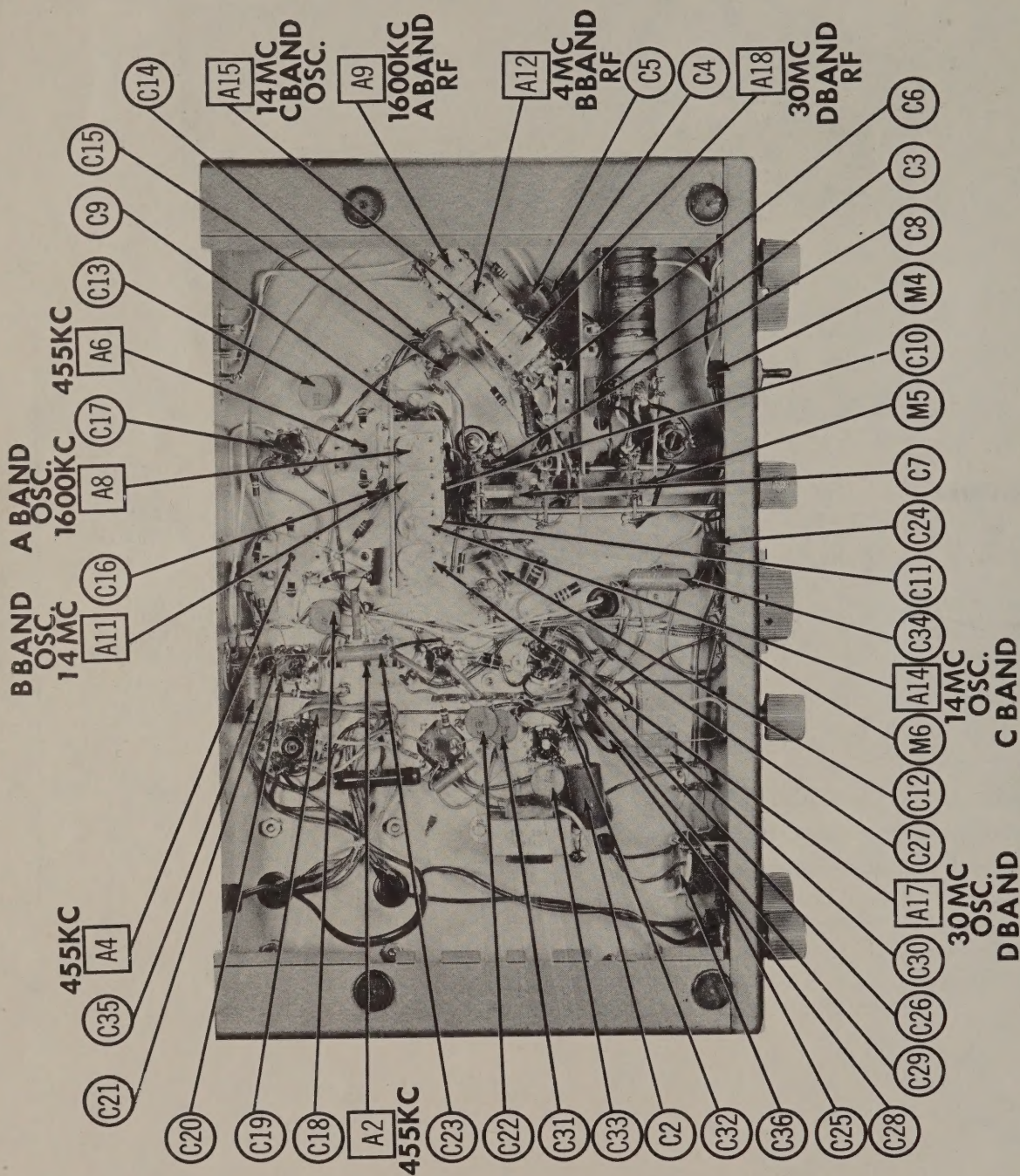
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



# ALIGNMENT INSTRUCTIONS

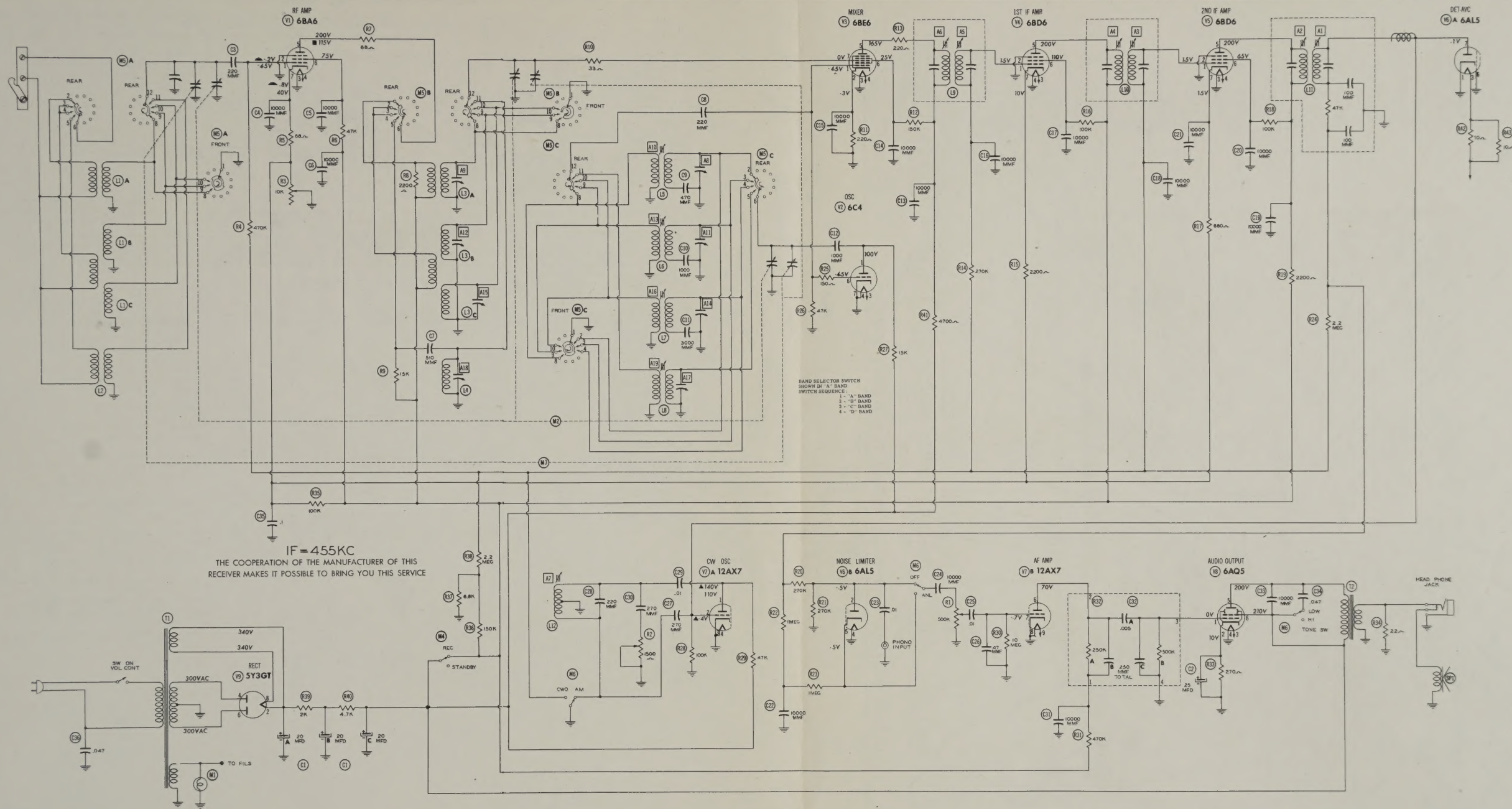
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT							
<p>Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.</p> <p>Remove external antenna and turn sensitivity control fully counter clockwise.</p> <p>Set the "receive-standby" switch to "receive" position.</p> <p>Set ANL-off switch to "off" position.</p> <p>Set AM-CW switch to "AM" position.</p> <p>Place the band spread pointer on the "set" mark (near 86 on the log scale).</p> <p>Turn on receiver and test equipment. Allow 15 minute warm up period.</p>							
IF ALIGNMENT							
DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1. .01MFD	High side to lug on stator plates of center section of tuning gang. Low side to chassis.	455KC (400vMod)	"A"	Tuning gang fully open	Across voice coil	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2. Check alignment of BFO oscillator by placing AM-CW switch to CW position. With pitch control tune BFO for zero beat with signal generator. Zero beat should occur when red dot on pitch control is at the top dead center position. If necessary, set pitch control to place red dot, at the top center position. Adjust A7 for zero beat. Return AM-CW switch to "AM" position.							
RF ALIGNMENT							
<p>Incorrect mechanical calibration is indicated when the frequency readings are off a certain equal linear amount on all bands. With the main tuning gang fully closed place the pointer at the first marker on the "C" scale (just to left) of 4.7MC marker.) With the band spread tuning gang fully closed set pointer to the zero marker on the log scale.</p> <p>The oscillator operates on the high side on the "A", "B" and "C" bands and on the low side on the "D" band.</p>							
DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
3. 300Ω Carbon Resistor	High side thru 300Ω to left hand antenna terminal. Low side to chassis (connect link from terminal "G" to middle terminal).	1600KC	"A"	1600KC	Across voice coil	A8, A9	Adjust for maximum deflection.
4. "	"	600KC	"	600KC	"	A10	Adjust for maximum deflection. Repeat steps 3 and 4.
5. "	"	4.0MC	"B"	4.0MC	"	A11, A12	Adjust for maximum deflection.
6. "	"	1.6MC	"	1.6MC	"	A13	Adjust for maximum deflection. Repeat steps 5 and 6.
7. "	"	14.0MC	"C"	14.0MC	"	A14, A15	Adjust for maximum deflection. If A14 has two peaks use the peak closest to minimum capacity. If A15 has two peaks use the peak closest to maximum capacity.
8. "	"	5.0MC	"	5.0MC	"	A16	Adjust for maximum deflection. Repeat steps 7 and 8.
9. "	"	30.0MC	"D"	30.0MC	"	A17, A18	Adjust for maximum deflection. If A17 has two peaks use the peak closest to maximum capacity. If A18 has two peaks use the peak closest to minimum capacity.
10. "	"	15.0MC	"	15.0MC	"	A19	Turn A19 counter clockwise as far as possible then turn clockwise until second peak is obtained. Adjust for maximum deflection on second peak. Repeat steps 9 and 10.





CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION





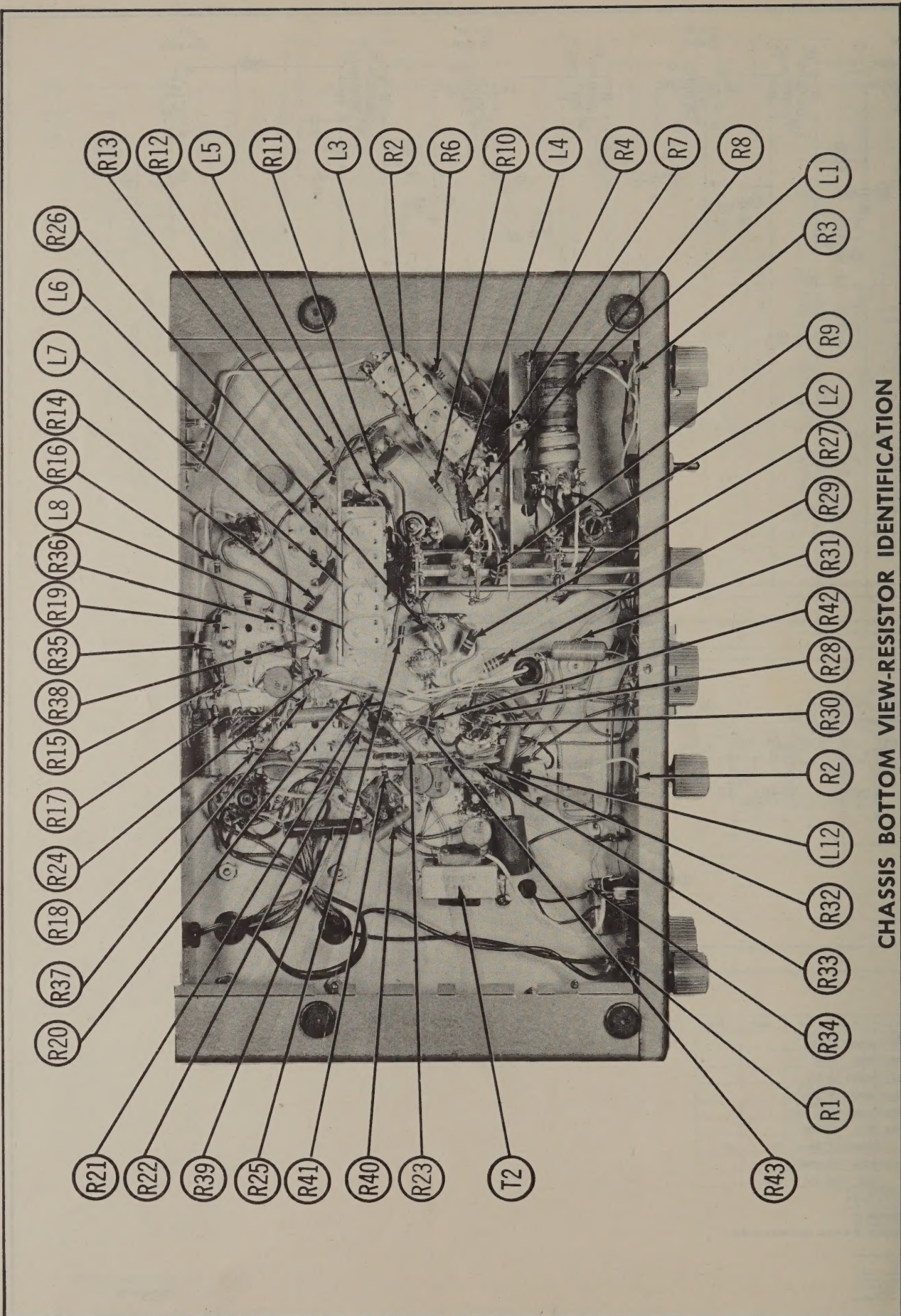
#### RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	1.8Meg	0Ω	0Ω	.1Ω	17KΩ	150KΩ	88Ω - 10KΩ		
V 2	6C4	122KΩ	INF	.1Ω	0Ω	122KΩ	47KΩ	0Ω		
V 3	6BE6	47KΩ	220Ω	0Ω	.1Ω	122KΩ	100KΩ	35Ω		
V 4	6BD6	1.6Meg	0Ω	.1Ω	0Ω	12KΩ	100KΩ	2.2KΩ - 12KΩ		
V 5	6BD6	1.3Meg	0Ω	0Ω	.1Ω	14.2KΩ	105KΩ	68Ω - 10.5KΩ		
V 6	6AL5	0Ω	270KΩ	2Ω	0Ω	2.5Meg	0Ω	550KΩ		
V 7	12AX7	150KΩ	100KΩ	0Ω	0Ω	0Ω	1720KΩ	10Meg	0Ω	.1Ω
V 8	6AQ5	500KΩ	270Ω	.1Ω	0Ω	12.3KΩ	12KΩ	500KΩ		
V 9	5Y3GT	INF	1Meg	INF	90Ω	0Ω	95Ω	.1Ω	1Meg	

1 MEASURED FROM PIN 2 OF V8  
2 MEASURED WITH M5 ON "D" BAND.  
3 MEASURED IN "CW" POSITION  
4 SENSITIVITY AT MINIMUM (FULLY COUNTER CLOCKWISE)  
5 SENSITIVITY AT MAXIMUM (FULLY CLOCKWISE)  
VOLTAGE & RESISTANCE MEASUREMENTS TAKEN ON BAND "A" UNLESS OTHERWISE NOTED.

- DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
- Socket connections are shown as bottom views.
- Measured values are from socket pins to common negative.
- Line voltage maintained at 117 volts for voltage readings.
- Resistor tolerance is component value unless otherwise noted.
- Values are in voltage and resistance readings.
- Values are at maximum, no signal applied for voltage measurements.





CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

NATIONAL  
MODEL NC-88



## CHASSIS—TOP VIEW

## CHASSIS—TOP VIEW

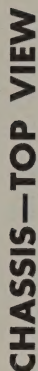
## CHASSIS—TOP VIEW

## CHASSIS—TOP VIEW

## CHASSIS—TOP VIEW

## CHASSIS—TOP VIEW

## CHASSIS—TOP VIEW





## PARTS LIST AND DESCRIPTIONS (Continued)

## CONTROLS

ITEM No.	RATING	REPLACEMENT DATA				INSTALLATION NOTES
		NATIONAL PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	K347-1	AG-60-Z	B-60-S	U-48	Volume
R1B	500KΩ	Not Req.	ES-2	B-60-S	Not Req.	Attach to R1A
R2A	1500Ω	K915-16	SWB	B-6	U-26	Attach to R1A
R3A	10KΩ	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3B	10KΩ	K349-3	A43-10K	R0, 000L	DS36	Sensitivity (wire wound)
R4	Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

## RESISTORS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
		NATIONAL PART No.	IRC PART No.	REPLACEMENT DATA	IRC PART No.	
R4	470KΩ	J569-57	BTS-470K	J569-15	BTS-150	
R5	68Ω	J569-11	BTS-68	J569-45	BTS-47K	
R6	47KΩ	J569-45	BTS-47K	J571-39	BTA-10K	
R7	68Ω	J569-11	BTS-68	J569-49	BTS-100K	
R8	2200Ω	J569-29	BTS-2200	J571-45	BTA-47K	
R9	15KΩ	J571-39	BTS-15K	J569-73	BTS-10Meg	
R10	33Ω	J569-7	BTS-33	J569-57	BTS-470K	
R11	220Ω	J569-17	BTS-220	* R983-1		
R12	150KΩ	J569-51	BTS-150K	J571-18	BTA-270	
R13	220Ω	J569-17	BTS-220	J571-5	BTA-100K	
R14	270KΩ	J569-29	BTS-270K	J571-49	BTS-150K	
R15	2200Ω	J569-29	BTS-2200	J569-51	BTS-6800	
R16	100KΩ	J569-49	BTS-100K	J569-35	BTS-2.2Meg	
R17	680Ω	J569-23	BTS-680	M707-2	1 3/4A-2000	
R18	100KΩ	J569-49	BTS-100K	R39	2000Ω	
R19	2200Ω	J569-29	BTS-2200	R40	4700Ω	
R20	270KΩ	J569-54	BTS-270K	R41	4700Ω	
R21	270KΩ	J569-54	BTS-270K	R42	10Ω	
R22	1Meg	J569-61	BTS-1Meg	R43	10Ω	
R23	1Meg	J569-61	BTS-1Meg			
R24	2.2Meg	J569-65	BTS-2.2Meg			

\* Items R32A, R32B, C32B, C32C are combined in one unit.

## TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	NATIONAL PART No.	STANCOR PART No.	MERIT PART No.	TRIAD PART No.
T1	117VAC	620VCT	5VAC	6.3VAC	K-316-2	PC-8408②③	P-315②③	R-9A②③
	④ .56A	.084ADC	⑤ 2A	⑥ 2.8A	K-316-5①		P8304②③	

① Alternate power trans.

② Drill new mounting holes.

③ Tape center tap on 6.3V winding.

## TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA			
	IMPEDANCE	DC RES.	PRI.	SEC.	NATIONAL PART No.	STANCOR PART No.	MERIT PART No.	TRIAD PART No.
T2	4.6KΩ	3.1Ω	295Ω	.56Ω	K313-3	A-3877	A-2930	S-3X
							Z1107	

① Drill one new mtg. hole.

## PARTS LIST AND DESCRIPTIONS (Continued)

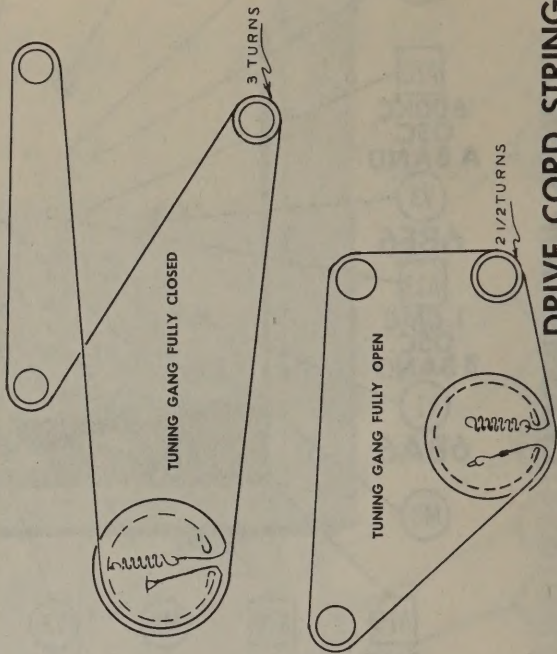
## COILS (RF-IF)

ITEM No.	USE	DC RES.		NATIONAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
		PRI.	SEC.					
L1A	Ant. Coil	30Ω	2.8Ω	SB:1517				Band "A", 540-1000KC
L1B	Ant. Coil	.8Ω	.8Ω					Band "B", 1.6-4.7MC
L1C	Ant. Coil	.9Ω	.9Ω					Band "C", 4.7-14MC
L2	Ant. Coil	.1Ω	.1Ω	SB:1519				Band "D", 14-40MC
L3A	RF Coil	30Ω	2.8Ω	SB:1518				Band "A"
L3B	RF Coil	.9Ω	.8Ω					Band "B"
L3C	RF Coil	.9Ω	.1Ω					Band "C"
L4	RF Coil	.0Ω	.0Ω	SB:1520				Band "D"
L5	Osc. Coil	.1Ω	1.5Ω	SB:1573-1	14-1060	BC-381	71-Osc.	Band "A"
L6	Osc. Coil	.8Ω	1.2Ω	SB:1574-1				Band "B"
L7	Osc. Coil	.1Ω	.1Ω	SB:1575-1				Band "C"
L8	Osc. Coil	.1Ω	.0Ω	SB:1576-1				Band "D"
L9	1st. IF Trans.	20Ω	20Ω	Q242-2				
L10	2nd. IF Trans.	20Ω	20Ω	Q242-2				
L11	3rd. IF Trans.	18Ω	18Ω	Q242-1				
L12	BFO Coil	6Ω	6Ω	SA:5361				Includes 47KΩ resistor and diode load filters Tapped @ 4.8Ω

\* Cut out chassis metal strip, use adaptor plate and add 47KΩ resistor externally.

## MISCELLANEOUS

ITEM No.	PART NAME	NATIONAL PART No.	NOTES
M1	Dial light	F136-11	# 47 bayonet
M2	Tuner	P705-2	General coverage (3 sections at 13-454MMF each)
M3	Tuner	P706-2	Bandspread (3 sections at 10-37MMF each)
M4	Switch	E230-2	Stand by-receive (toggle-SPST)
M5	Switch	S245-1	Band selector
M6	Switch	L209-2	(3) ANL-off, tone HI-LI, AM-CW (slide SPDT)
	Trimmer cap	S662-1	Antenna-air variable (5-50MMF)
	Trimmer cap	D832-5	RF-mica (4) used (2.2-40MMF)
	Trimmer cap	E31-2	Osc-ceramic (2) used (5-20MMF)
	Trimmer cap	E31-1	Osc-ceramic (2) used (2.5-6MMF)
	Knob	SA:5292-2	Large (3) used-antenna, main and band spread tuning
	Knob	SA:9305	Small (4) used-sensitivity, band select, pitch, volume



DRIVE CORD STRINGING